DOCUMENT RESUME

ED 304 680 CS 009 580

AUTHOR Commeyras, Michelle
TITLE Analyzing a Critical-Thinking Reading Lesson. Technical Report No. 464.
INSTITUTION Bolt, Beranek and Newman, Inc., Cambridge, Mass.; Illinois Univ., Urbana. Center for the Study of Reading.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE Mar 89
CONTRACT OEG-0087-C1001
NOTE 26p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Basal Reading; Case Studies; Content Analysis; Critical Reading; *Critical Thinking; Instructional Effectiveness; Intermediate Grades; Reader Text Relationship; *Reading Comprehension; *Reading Instruction; Reading Research; Teaching Methods
IDENTIFIERS Thinking Skills

ABSTRACT

To illustrate the interdependent relationship between critical thinking and reading comprehension, and to show that critical thinking can be infused into classroom instruction using ordinary classroom materials (e.g. selections from a basal reading series), a study analyzed the transcript of a critical-thinking reading lesson for sixth grade students. The lesson was designed for "A Stranger at the Door," a basal reader selection and short excerpt from the book "The Death of Evening Star," by Leonard Everett Fisher. Students read the story independently and completed a written assignment before meeting to discuss the story. The assignment entailed gathering evidence to support two different hypotheses about the story that would be considered in the discussion. Analysis of the discussion revealed that students used critical thinking when given the opportunity. Students gave reasons that could serve as evidence for two explanatory hypotheses, supported their judgments when they evaluated the strength of those reasons, and made inferences which integrated background knowledge with textual information. However, sometimes students' critical thinking was faulty because they misread the text or made unfounded assumptions. (Twenty-three references are attached.) (MM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED304680

CENTER FOR THE STUDY OF READING

Technical Report No. 464

ANALYZING A CRITICAL-THINKING READING LESSON

Michelle Commeyras
University of Illinois at Urbana-Champaign

March 1989

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
D. Anderson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

University of Illinois at Urbana-Champaign
51 Gerty Drive
Champaign, Illinois 61820

The work upon which this publication was based was supported in part by the Office of Educational Research and Improvement under Cooperative Agreement No. OEG 0087-C1001, with the Reading Research and Education Center. The publication does not necessarily reflect the views of the agency supporting the research.

CS005580

EDITORIAL ADVISORY BOARD
1988-89

Beck, Diana

Commeyras, Michelle

Foertsch, Daniel

Hartman, Doug

Jacobson, Michael

Jehng, Jihn-Chang

Jimenez, Robert

Kerr, Bonnie

Kerr, Paul

Meyer, Jennifer

Moran, Juan

Ohtsuka, Keisuke

Roe, Mary

Schommer, Marlene

Scott, Judy

Stallman, Anne

Wilkinson, Ian

Wolff, Phillip

MANAGING EDITOR
Mary A. Foertsch

MANUSCRIPT PRODUCTION ASSISTANTS
Delores Plowman
Nancy Diedrich

Abstract

In this paper the transcript of a critical-thinking reading lesson that was designed for sixth grade students is analyzed. The analysis was conducted in order to illustrate the interdependent relationship between critical thinking and reading comprehension and to show that critical thinking can be infused into everyday classroom instruction using ordinary classroom materials (e.g., selections from basal reading series). The analysis describes the critical thinking dispositions and abilities that were sought from the students and those that they exhibited; it explores the factors that might account for the instances where critical thinking went awry; and it points out pedagogical strategies that a teacher could use to facilitate critical thinking.

ANALYZING A CRITICAL-THINKING READING LESSON

A qualitative analysis of a transcript of a critical-thinking reading lesson is presented in this paper. The analysis was conducted in order to provide a convincing example that shows there is an interdependent relationship between critical thinking and reading comprehension and that shows critical thinking can be promoted in everyday classroom instruction using regular classroom materials. This approach is known as infusing critical thinking into the existing school curriculum (Swartz, 1987). The analysis also focuses on the critical thinking dispositions and abilities that were sought from the students and those that they exhibited. It also identifies the factors that interfered with critical thinking, and it mentions some pedagogical strategies that may help to promote critical thinking.

The lesson that is the subject of this analysis was developed when I was a sixth grade teacher. One of my goals as a reading teacher was to find ways to promote critical thinking using selections in the basal reader. This led to the development of what I have come to call "critical-thinking reading lessons." My objectives for these lessons were to improve the students' critical thinking ability and to encourage them to be disposed to use critical thinking in order to aid their reading comprehension and their thinking in general.

It has been claimed that reading comprehension calls for critical thinking (Norris & Phillips, 1987) and thinking critically about text requires reading comprehension (Wolf, King, & Huck, 1968). The claim that critical thinking is closely related to reading comprehension is similar to the view that reasoning is an integral part of reading. This latter view has been acknowledged by many who have theorized about the process of reading (Betts, 1950; Gray, 1949; Huey, 1908; Russell, 1963; Thorndike, 1917). The comprehension of text requires the reader to use reasoning to evaluate possible interpretations to determine the meaning of a text. Critical thinking, which involves reasoning, is the process the reader uses to determine which interpretations are consistent with textual evidence and background knowledge. This relationship between reading and critical thinking is consistent with the constructivist view of reading (e.g., Spiro, Bruce, & Brewer, 1980). In the constructivist view, reading is the process of constructing meaning from text and background knowledge (Pearson & Tierney, 1984).

The conception of critical thinking that I promoted in my teaching and upon which this paper is based comes from the work of Robert Ennis (1962, 1964, 1987). His conception of critical thinking includes dispositions and abilities involved in the pursuit of "reasonable reflective thinking that is focused on deciding what to believe or do." It also includes strategies and tactics related to the context in which critical thinking occurs. The following is an abbreviated list of the 14 dispositions and 12 abilities that Ennis (1987) recommends as "Goals for a Critical-Thinking/Reasoning Curriculum" (p. 10). This abbreviated list is included because many of these dispositions and abilities will be referred to in my analysis of the critical-thinking reading lesson.

Dispositions:

1. Seek a clear statement of the thesis or question.
2. Seek reasons.
3. Try to be well-informed.
4. Use credible sources and mention them.
5. Take into account the total situation.
6. Try to remain relevant to the main point.
7. Keep in mind the original and/or basic concern.
8. Look for alternatives.
9. Be open-minded.
   a. Consider seriously other points of view.
   b. Reason from premises with which one disagrees.
   c. Withhold judgment when evidence is insufficient.
10. Take a position (and change a position) when the evidence and reasons are sufficient to do so.

11. Seek as much precision as the subject permits.
12. Deal in an orderly manner with the parts of a complex whole.
13. Use one's critical thinking abilities.
14. Be sensitive to the feelings, level of knowledge, and degree of sophistication of others.

Abilities:

Elementary Clarification
1. Focusing on a question.
2. Analyzing arguments.
3. Asking and answering questions of clarification.

Basic Support
4. Judging the credibility of a source using criteria.
5. Observing and judging observation reports using criteria.

Inference
6. Deducing, and judging deductions.
7. Inducing, and judging inductions.
8. Making and judging value judgments.

Advanced Clarification
9. Defining terms, and judging definitions.
10. Identifying assumptions.

Strategies and Tactics
11. Deciding on an action.
12. Interacting with others.

Background Information

The eight students who participated in this lesson attended the only elementary school in a small rural/suburban town north of Boston. They were in the "top" sixth grade reading group. This was their first experience with a reading lesson that I had purposefully designed to focus on critical thinking. I decided to video-tape the lesson for use in a breakout session at a conference on teaching thinking skills. The tape has provided me with an opportunity to analyze carefully one of my attempts to incorporate critical thinking into the reading lesson.

The Lesson

The lesson was designed for the selection "A Stranger at the Door" in the basal reader done by Clymer, Peterson, Gates, L'Amoreaux and Wardeberg (1976). This selection is a short excerpt from the book The Death of Evening Star by Leonard Everett Fisher (1972).

IT WAS A STRANGE and eery night. A storm was raging outside when the doorbell of the old house rang.

My wife, three children and I returned to the old house in Sea Gate for a family visit. No sooner had we arrived when a violent storm fell out of the sky and lashed the area. The house shook. The sound and fury of the smashing surf mixed with driving rain and an assortment of thunderclaps was deafening. The lights nervously flickered off and on until they went out altogether. The rotating, flashing red beacon of the Norton's Point Lighthouse, nearby, cast a devilish beam into the living room as always. Now, without house lights, it seemed brighter. Within a few minutes, however, emergency candles burned in various parts of the house.

Somehow, above the sound of the storm, I heard the insistent clanging of the doorbell. Thinking it was the back, or leeward, door - since that was the only entrance used during the winter or bad weather - I raced for it and opened it. No one was there. I crossed the foyer and headed for the seaward door - the main

entrance - wondering why anyone would be using it now. I reached the door, had some difficulty unlocking it, but finally flung it open.

Standing there, hatless and dripping, the pounding surf not fifty yards behind him, was a ghost newly risen from the bottom of that raging sea - Amos Poole! At least, that is who I thought it was in the half light of a candle.

"You won't remember me," yelled the shadowy, sopping figure. "I'm Charlie Poole."

I remembered Charlie Poole, all right, but this was not Charlie Poole!

I drew back, staring at what I knew had to be the ghost of Amos Poole - Admiral Amos Poole - dead and buried twenty-five years before! I was not about to invite him in.

"I'm Charlie Poole," he yelled again. "I used to be the light-keeper," he added, pointing a knotty finger toward the flashing beacon. "I jes' came over to give you this," he bellowed over the crashing storm. "I found it over at the light and thought you'd be interested in having it considerin' how friendly you and my father used to be. I didn't expect to find you and the old family still here. But I took a chance and came over."

He shoved a package into my trembling hands. The package, a box wrapped in old brown paper tied together with a hairy string, was soaking wet.

He started to leave, hesitated, turned around and spoke again. "I jes' came down from New Bedford way to see the light once more."

A likely story I thought.

"She's a beauty, you know. She shor' is. There are no more of us Pooles. I'm the last. Take care of them papers."

With that, Charlie Poole, Amos Poole's ghost or whoever he was, disappeared into the storm. For all I know he went back into the sea where he probably came from. I could believe anything at that point. I stood there, in the open doorway, quivering from head to toe. Finally I shut the door, locked it and placed the package on a table.

"Who was that?" someone called out.

"No one," I answered, "just the wind and rain."

The students read this story independently and completed a written assignment before meeting to discuss the story. The assignment entailed gathering evidence to support two different hypotheses that would be considered in the discussion. This approach is in keeping with the philosophy that teaching should "develop a sort of learning in which the student will be capable of backing his beliefs by appropriate and sufficient means" (Scheffler, 1965).

The students brought to the reading group their lists of reasons, one that supported the hypothesis that the stranger was the ghost of Amos Poole and another that supported the hypothesis that the stranger was Charlie Poole. First, the students gave their reasons for believing that the stranger was the ghost of Amos Poole. These reasons were written on the chalkboard and then the students evaluated them by discussing their strengths and weaknesses. This same procedure was followed for reasons that supported believing the stranger was Charlie Poole who was not a ghost. The lesson ended with each student identifying who came to the door on that stormy night.

Analysis of the Transcript

Teacher: *Well, that is the story that we are going to focus on but before we start, I want to ask whether or not you believe in ghosts. How many of you believe there might be such things as ghosts? Do any of you? One, two, three, four, five - How many of you are convinced that there are no such things as ghosts? Two, okay, well your beliefs might influence the way you look at this story. We're going to look at this story in some detail to try and determine who the stranger at the door was.*

I raised a question that was designed to get the students to state what their beliefs were regarding ghosts before they discussed whether or not the stranger at the door was a ghost. This was an important question to begin the lesson with because the students' beliefs about ghosts might have influenced their thinking about the stranger at the door. The students needed to keep in mind that what matters is whether or not in the world the author created the narrator had good reasons to believe the stranger was the ghost of Amos Poole. After all, in the world of stories, ghosts can exist even if we do not believe they exist in the "real" world.

Identifying one's own beliefs is important in critical thinking because those beliefs influence one's thinking and they might limit one's thinking. In order to truly engage in critical thinking one must be willing to temporarily suspend belief or consider the possibility that one's own beliefs are incorrect. This willingness is often referred to as the disposition to remain open-minded. A critical thinker should try and remain open-minded whenever it appears that there is insufficient evidence and reasons for a position or decision to be adopted.

Evidence that supported the hypothesis that the stranger was the ghost of Amos Poole

Teacher: *The first thing I want us to focus on are some of the reasons that you came up with for believing that the stranger was the ghost of Amos Poole.*

I asked the students to give evidence in the form of reasons for the hypothesis that the stranger was the ghost of Amos Poole. The reasons they offered should either support the hypothesis or should defeat the alternative hypothesis (the stranger was Charlie Poole who was not a ghost). If a reason was given that supported one hypothesis but did not defeat the alternative hypothesis then that reason did not establish whether the stranger was the ghost of Amos or his son Charlie. If reasons failed to support either hypothesis, then they were considered inappropriate. If the students gave a reason that supported both of the hypotheses, then that reason did not help to resolve the issue; that is whether the stranger was the ghost of Amos or his son Charlie.

This activity was intended to get the students to practice their ability to identify stated and unstated reasons, which is an aspect of elementary clarification in critical thinking. The act of identifying reasons for the two hypotheses regarding the stranger's identity should provide clarification because it requires citing relevant textual evidence and using appropriate background knowledge.

Reason One - People usually don't deliver papers in the middle of a storm.

Chris: *Some of the reasons he was a ghost was first of all no-one gives someone some papers in the middle of a storm because something might happen and second of all . . .*

Teacher: *One at a time so that I can understand - The first one is that nobody gives someone some papers in the middle of a storm.*

Chris: *I mean couldn't you wait until after the storm to give him the paper? Why would he come during the storm?*

Teacher: *Okay, it is unlikely then that a person would come in the middle of a storm to deliver some papers. Let me write that down.*

Chris proposed that people don't usually go out in a raging storm to deliver some papers. The stranger's behavior did not conform to what Chris believed people usually do during a storm. Chris used his background knowledge of human behavior and textual evidence to support the hypothesis that the stranger was a ghost.

Notice that I stopped Chris from giving more than one reason. I did this because I wanted to establish a way of proceeding that would be orderly and promote focusing on one issue at a time. It is important in a critical-thinking reading lesson to remain focused and to move deliberately and sometimes slowly in order to give careful consideration to each issue. This manner of procedure is consistent with research that has investigated effective teaching. For example, Brophy and Good (1986), in reviewing research on teacher behavior, found evidence that well organized lessons were more likely to maximize student achievement.

Also, I restated Chris' reason in order to make sure that I represented it accurately before I wrote it on the chalkboard. Restating what Chris said is a way of assuring him that he said something worthwhile. Using a student's idea by restating, rephrasing, applying, comparing, or summarizing it shows that the teacher accepts and wants to incorporate the idea into the lesson (Flanders, 1965). Brophy and Good (1986) came to the conclusion that teachers should include relevant student comments into the lesson because it shows respect for their ideas: "use of student ideas appears to become more important with each succeeding grade level, as students become both more able to contribute useful ideas and more sensitive to whether teachers treat their ideas with interest and respect" (p. 365).

In addition, restating Chris's reason gave the other students more time to think about the reason. Chris responded to my restatement by adding additional information that clarified what he meant. The ability to clarify what one means is central to critical thinking. Chris tried to make it clear why his reason was relevant.

Reason Two - The stranger arrived at the front door which isn't used in stormy weather.

In the following excerpt Aaron gave two reasons, the first one he abandoned after I pointed out that he was mixed up. His second reason was mixed up as well, but it was corrected when I recorded it on the chalkboard. Aaron's errors will be analyzed in more depth following the excerpt.

Teacher: *Who has something different? A different reason.*

Aaron: *The stranger looked like Charlie Poole but he was dead. So he couldn't have been a ghost of him if he was dead.*

Teacher: *Wait a minute who's dead?*

Aaron: *Charlie Poole*

Teacher: *Emm, I think you're, I got confused with these two people. Amos Poole was the father, the admiral, and the narrator knows that he's dead--so do you want to reformulate your reason?*

Aaron: *Well, I've got another reason. Because some of the reasons that support that the stranger is a ghost is the person came to the back door on a stormy night cause why didn't they just go to the front door instead of the back door?*

Teacher: *Okay - How many others had that reason? I still think your other reason might be good but you got mixed up about who the people were. Maybe somebody else can help you with that or has something similar.*

I questioned Aaron about his first reason because he had the details wrong. He said Charlie Poole was dead. I tried to help Aaron by explaining the difference between Charlie and Amos Poole, but Aaron did not choose to use that information to restate his reason. Apparently, Aaron did not stop to consider what I had told him about Amos and Charlie Poole. Perhaps, Aaron was embarrassed about being "wrong" and took what he saw as the easy way out - - to give another reason. A better way of handling that situation would have been to tell Aaron that I did not understand his reason, and could he tell me more about it. By giving him the information about Amos and Charlie Poole I may have promoted the traditional teacher-student interaction where the teacher has the "right" answers and the students try to figure out what those "right" answers are. This typical teacher- student interaction does not help to promote critical thinking because it inhibits the students thinking and sets the teacher up as the authority. Instead it is better to foster an atmosphere of cooperative thinking where everyone feels they are working together in order to clarify the issues and/or questions of concern. In critical thinking activities it is important to seek as much precision as a subject or situation permits; precision is part of making thoughtful and informed decisions; in this situation it would have been possible to follow through and get the reason stated in a manner that was precise with regard to the information in the text.

Aaron's second reason reflects sound reasoning but again he had the details wrong. Aaron said the stranger came to the back door instead of the front door when in fact it was just the opposite. At the time of the lesson I did not realize that he had the facts wrong. I automatically corrected his error when I wrote his reason on the chalkboard. Fortunately, another student clarified the significance of this reason later in the lesson. Listening carefully to what others say is important for both teacher and students in critical thinking for a number of reasons, one of which is that it is important to realize when clarification is needed.

It is possible that Aaron's mistake regarding which door the stranger came to is the result of background knowledge interference. Aaron might have confused the front and back door because the door that is most likely to be used is different for beach houses than for most other houses. Homes by the ocean typically have a front door that faces toward the water and a back door that is close to the road or driveway leading to the house. This means that most visitors that arrive by car or from the road would go to the nearest door, which is the back door. The front door is usually used when people are coming and going to the beach. During a storm people coming to visit do not usually approach the house from the beach. They would be more likely to be traveling on the road which would lead them to the back door. In this situation Aaron may have been relying on assumptions that were based on his background knowledge. Aaron (who does not live by the ocean) was probably thinking of the typical house in his town where visitors usually come to the front door. Aaron's lack of "beach house" background knowledge or his overwhelmingly familiar knowledge of suburban homes may have interfered with his reading comprehension. The phenomena of background knowledge interference has been found in studies that investigated difficulties that arise in comprehension (Anderson, Reynolds, Schallert, & Goetz, 1977; Carey, Harste, & Smith, 1981). Hildyard and Olson (1982) found that children had difficulty with the literal meaning of text when it contradicted what they knew or believed to be true.

Reason Three - People don't go for walks to visit in the middle of a storm.

Bart: *I had that Charlie Poole said that or whoever he was that he just came down to see the lighthouse and most people wouldn't just go on a walk in the middle of a storm to visit people.*

Bart used his knowledge of human behavior and facts from the text to support the hypothesis that the stranger is a ghost. Bart thought that the stranger's behavior was not typical of human beings. His reason implied that the stranger's behavior might be that of a ghost.

Reason Four - The narrator recognized the stranger as Amos and he knew Amos was dead so the stranger must have been the ghost of Amos.

Doug: *The guy thought that he saw Amos Poole, his old friend who was dead, and he probably would have known him. I mean, if he was his old friend.*

Teacher: *He recognized him as being Amos but Amos is dead?*

Doug: *Yeah.*

Doug's reason relied primarily on textual evidence. Doug used the narrator's claim that he recognized his old friend, Amos Poole, and he knew that Amos was dead. This reason supported the hypothesis that the stranger was a ghost, but it did not defeat the alternative hypothesis that the stranger was Charlie Poole. The narrator could believe he was seeing Amos Poole when in fact he was seeing an older Charlie who now looks like Amos.

Reason Five - A person would not go out without a hat during a raging storm.

Jake's reason had to be revised because it was based upon insufficient textual evidence. That is, his reason was based upon an assertion that could not be supported by the text. When I pointed this out to Jake, he either did not understand or did not want to accept my objection.

Teacher: *Jake.*

Jake: *He had no coat or anything so it is a good possibility that he came from the sea cause he had no coat in the storm.*

Teacher: *Oh, it says he didn't have a coat?*

Jake: *Yeah.*

Teacher: *How did you know that?*

Jake: *Cause it says (reads) "standing there hatless and dripping."*

Teacher: *Hatless and dripping?*

Jake: *Yeah, I know but you usually wear a coat or something when its raining.*

Teacher: *So you're thinking because he doesn't have a hat on he also doesn't have a coat on?*

Jake: *Probably not, it didn't say he had a coat.*

Teacher: *Yeah.....I know, but, can we make that assumption?*

Jake: *That he didn't have a hat?*

Teacher: *You're making the assumption that if he didn't have a hat then he probably didn't have a coat. What do some of the others of you think? Should we make that assumption, that he didn't have a coat on?*

Doug: *Sometimes I go out in the rain and I don't wear a hat.*

Teacher: *But do you wear a coat?*

Doug: *Yeah - I always wear a coat.*

Teacher: *Umhuh.... so maybe we shouldn't make the assumption that Jake's making.*

Doug: *Yeah, but we could. It is a possibility.*

Teacher: *Jake would you say that the fact that he was hatless would be evidence that he came out of the water which only a ghost would do?*

Jake: *Yeah, because it was a real violent storm so usually you'd wear a coat or something.*

Teacher: *Okay so you're saying a human being in that kind of weather would have a hat on and since he didn't have a hat on then, in fact, maybe he was a ghost who had risen from the sea. Okay?*

Jake: *Yeah.*

Teacher: *That, I think, is safer because we don't know about the coat. So, you are assuming something that maybe you shouldn't be assuming.*

Jake's reason is based upon a misreading of the text or an assumption that hatless people are coatless. I asked Jake to find support for his contention that the stranger was not wearing a coat because I remembered that the text specifically said that the stranger was hatless. I pursued a line of questioning that focused on recognizing assumptions. I interpreted Jake's mistake as an example of making unfounded assumptions and I tried to show him that just because the text says the stranger is hatless does not mean one can assume he is coatless as well.

It is possible that Jake was not making an assumption, maybe he just did not read the text carefully enough and did not want to admit his mistake. Throughout our exchange he kept mentioning a coat despite my emphasizing that there was no evidence in the text that the stranger was not wearing a coat. It is possible that Jake just did not want to admit that he was mistaken or that he really did not understand my objection to his supposing that the stranger was coatless. I tried to lead Jake to accept a reason using only the information that the stranger was hatless. It appears from Jake and Doug's comments that they were willing to go beyond the information in the text perhaps in order to save face. I kept directing them by my refusal to accept an answer that could not be supported with direct evidence from the text. I was trying to show the students that reasons have to be supported by the information in the text.

Evaluating the evidence given to support the hypothesis that the stranger was the ghost of Amos Poole

Teacher: *Now the question I want you to think about is: Which is the best reason? If you were to argue with somebody that the stranger in the story is a ghost, which of these reasons would you choose as the best reason to argue your point? Does anybody have an opinion?*

This part of the lesson was designed to involve the students in evaluating reasons because this is an important aspect of critical thinking. I asked the students to compare and contrast the reasons listed on the board in order to determine which reason best supports the view that the stranger was a ghost. The students were expected to give reasons to support their choice of the "best" reason. This

pedagogical strategy has been recommended to promote comprehension monitoring. In a review of research on comprehension monitoring, Markham (1985) concluded that children need practice in making judgments that evaluate inferences and explanations. She based this conclusion on evidence from several experiments in which subjects failed to recognize inconsistencies in textual information, made unwarranted inferences, and could not identify adequate explanations for texts that were illogical. Markham suggested that students be given several explanations and be asked to judge which one provided the best explanation. The strategy that I employed differed from Markham's suggestion in that the students generated the explanations before evaluating them.

The emphasis on one best reason may be misleading with regard to critical thinking because often there is no one best reason but a number of reasons that support a conclusion. I asked the students to identify one best reason for pedagogical reasons. I thought it would force them to evaluate the reasons more closely if they were looking for the best reason. Sometimes teaching techniques that promote process come into direct conflict with principles of critical thinking.

Chris: *I think the best reason is "People don't go for walks to visit in the middle of a storm". Because it really wouldn't be likely that a guy would just be walking around in real stormy weather with thunder and lightning. I mean, it just acts like he was walking around casually in the story like when he turned around he just walked off back onto the beach. I mean, if you did deliver something to someone during real stormy weather--I think you're wrong because you wouldn't want to get that wet. Maybe you could catch a cold if you were just walking around getting soaked to death.*

Teacher: *It is almost as if he's oblivious or unaware of the fact that he's out in this raging storm. I mean, you or I or most of us would be rather affected by the weather.*

Chris: *Yeah, like you'd be running around; this guy acts like there isn't any storm or anything.*

Chris defended a reason by elaborating it. He introduced the issue of health to support the contention that most people do not go on walks in the middle of a storm because they would be concerned about getting sick. He also referred to an impression he got from the story, that the stranger seemed undaunted and unaware that he was out in a raging storm. Chris is inferring from the information in the text that the stranger is not concerned about being out in a raging storm. Chris cites this as evidence that the stranger is not acting in manner that would be typical for most people but may be typical of ghosts. Elaborating a reason is one way to defend the strength and applicability of that reason.

Teacher: *Okay! Does anybody think there's another reason that's stronger than that or that is more convincing than that? What do you think Doug?*

Doug: *I think "People usually don't deliver papers in the middle of a storm" is the best one. Because, how many people deliver anything in the middle of a storm unless it's for an emergency? I mean, you would if someone was hurt or something and needs a first aid kit or something, but not papers.*

Teacher: *You're saying that this isn't a very important delivery, or at least it doesn't seem to be?*

Doug: *Yeah.*

Teacher: *Okay, that's interesting.*

Doug demonstrated his ability to reason deductively in order to argue that the best reason for believing the stranger was a ghost was that he was out in a storm delivering papers. Doug's deductive argument goes something like this:

A person would not go out in a storm unless there was an emergency.
Delivering a package of papers is not an emergency.
The stranger was out in the storm delivering papers.
Therefore, the stranger was not a person.

Doug's argument is compelling only to the extent that the three premises upon which his conclusion rests are judged to be acceptable. There is evidence in the story that challenges the premise that the stranger went out in the storm to deliver papers. The stranger says that he was out to see the lighthouse once more and came across the papers and thought the neighbors might be interested in keeping them. The author seems to be implying that delivering the papers was an afterthought. There were a number of opportunities for critical thinking in this lesson, several of which were not pursued. This is one example where an assertion is made that is not necessarily supported by the text.

Bart: *I think number 3 is the best reason, "People don't go for walks to visit in the middle of a storm." Why would he just go on a little pleasure stroll in the middle of a storm to visit a lighthouse?*

Teacher: *Okay, you wonder what he was doing out in a storm looking at a lighthouse.*

Here, Bart attempted to strengthen the reason he gave earlier, which was that, "most people wouldn't just go on a walk in the middle of a storm to visit people." He did this by referring to the stranger's walk as "a little pleasure stroll." This reference helps to characterize the stranger's behavior as being highly improbable for human beings.

It is possible that Bart was questioning the stranger's credibility. Bart may have been doubting the truthfulness of the stranger's claim that he was out to visit the lighthouse once more. I could have asked Bart if he thought the stranger was lying about his reason for being out in the storm. If Bart suspected the stranger of misrepresenting his reason for being out in the storm, then the stranger's claim that he was Charlie Poole would also be suspect. One criterion for assessing the credibility of a statement is to consider the person's reputation for being truthful. If one has a reputation for not telling the truth then one's credibility is weakened.

Here was an instance where I could have sought more information from Bart in order to better understand his thinking and possibly to help him be more complete in expressing his ideas. It is important in teaching for critical thinking to realize when it is appropriate to elicit more information from the students about their reasoning.

Jake: *I'd say that the stranger arrived at the front door, which isn't used in stormy weather, is the best reason because, like, it says the front door is facing the beach so he probably rose from the sea and the front door was closest and so he went to the front door. But, you know, it's not used for bad weather and it's probably easier to go to the back door if you're not going along the beach. Not many people would be on the beach.*

Teacher: *Okay, if somebody, a human being, arrived, they'd probably come to the back door instead of going all the way around to the front door.*

Jake defended and elaborated a reason that Aaron had given earlier. Jake's elaboration clarified why this reason lends support to the hypothesis that the stranger was a ghost. Jake used information in the text and his background knowledge to explain why it would be more likely that a person would come to the back door of the beach house and to explain why a ghost would be likely to arrive at the front door. In some cases, the process of seeking the best reason led students to provide explanations for reasons that may not have been clear when they were first offered.

Doug: *I have an argument with the reason "People don't go out for walks to visit in the middle of a storm." It says in the story "the rotating flashing red beacon of Norton's point lighthouse nearby cast a devilish beam into the livingroom as always now without house lights it seemed brighter." Now that it was brighter and it was dark and stormy, maybe the guy, Charlie Poole, wanted to see it.*

Teacher: *He wanted to what?*

Doug: *He wanted to see it. It's pretty, probably, the light, so he'd probably want to see it.*

Teacher: *You're saying it's not so strange that a person would want to come during a storm to look at a lighthouse because it's kind of fantastic.*

Doug: *Um, maybe like he was at a friend's house who was not too far away and he just did a little errand.*

Teacher: *Good, you're introducing alternative explanations that could explain why somebody might have been there who wasn't a ghost.*

Doug offered an alternative interpretation of the text that provided a logical explanation for the stranger's visit to the lighthouse during the storm. Doug suggested that the description of the lighthouse could be interpreted as being a spectacular sight which was worth venturing out in a storm to see. If one accepts Doug's interpretation, then the stranger's behavior does not necessarily lead one to think he was a ghost. Doug showed that believing the stranger was the ghost of Amos Poole is not necessarily explained by the stranger's visit to the lighthouse during a raging storm.

I explicitly identified the aspect of critical thinking that Doug was exhibiting in order to show him and the other students that seeking alternative explanations is a good thing to do. When it is appropriate and possible, it is good to explain to the students what aspect of critical thinking they are engaging in so that they can become more aware of their own thinking (Meichenbaum, 1985).

Sean: *I think that the narrator recognized the stranger as Amos and that he knew that Amos is dead is the best reason for believing the stranger was a ghost because if someone's dead for 25 years and someone comes out of the ocean that looks just like him and knows everything that person did, then I think it would be the ghost of him.*

Sean defended this reason by accepting the narrator's statements as true. Sean did not explain why he thought the narrator was correct therefore his argument lacked the reasoning necessary to support the belief that the narrator was a reliable observer. Basically, all Sean said was that he accepted the narrator's conclusion that the stranger was the ghost of Amos Poole who had risen from the bottom of the sea.

Reasons to support the hypothesis that the stranger was Charlie Poole.

Approximately half way through the 45 minute period, I asked the students to give evidence which supported the hypothesis that the stranger was Charlie Poole and not the ghost of Amos Poole. They generated a list of six reasons that could be used as evidence to support the hypothesis.

Reason One - Charlie was older now and resembled his father Amos.

Tina: *Maybe his son looks just like him.*

Teacher: *Okay, interesting point.*

Doug: *How many people do you see that have a twin that looks just like him?*

Tina: *Some people look like their parents.*

Jake: *Like father, like son.*

Teacher: *Okay, so your saying that it really may be the son, but he looks like the father now that he's older.*

Tina: *Yeah.*

Tina made a suggestion that would explain why the stranger looked like Amos Poole but actually is Charlie Poole. Tina and Jake knew that children often grow to resemble their parents and they used this background knowledge to make the inference that Charlie might look like his father Amos.

Reason Two - Charlie wanted to deliver the papers before he died so the storm didn't matter.

Chris: Well, the first reason we had for believing the stranger was the ghost of Amos Poole is someone would not deliver papers in the middle of a storm. Well maybe Charlie Poole was like near death, like he was almost dead, sick or something. So he just had to deliver the papers sometime and maybe he thought he might die tomorrow and so he had to deliver the papers right away. And maybe he'd be walking around casually in a raging storm because he knew he had nothing to lose because he was almost dead.

Chris offered an alternative explanation for the stranger's visit during the storm. His reason for the stranger's behavior is explained by the hypothesis that the stranger was Charlie Poole. Chris used his knowledge of human behavior to show that people sometimes have reasons to go out in raging storms. Chris could have made a stronger case for his reason by citing some of the textual evidence that would support the inference that the stranger was old and possibly near death. The stranger had a "knotty finger," was the last of the Pooles, and he just came down "to see the light once more." Reasons are more valid when they can be supported with textual evidence.

Reason Three - The bad lighting made it hard for the narrator to see who the stranger was.

Jake: *He didn't have very good light so maybe he wasn't seeing good. He said he only had "the half light of a candle" maybe he couldn't see very well.*

Teacher: *How would that lead the narrator to think the stranger was not a ghost?*

Jake: *Well, maybe he thought it was Amos Poole, because of the light he looked like Amos but it really was Charlie because, you know, the family resemblance.*

Teacher: *Okay, so bad lighting made it hard for him to really see who was there.*

Jake brought up the fact that there wasn't much light available that night and that this could explain why the narrator thought the stranger was Amos Poole rather than an older Charlie Poole. Jake's comments reflected critical thinking because he was judging the credibility of observational reports. Jake recognized that the conditions were not optimal and that this could affect the credibility of the narrator's observations. An observation tends to be believable to the extent that the conditions provide a satisfactory medium for observation. In critical thinking, deciding what to believe or do depends in part upon the ability to reliably make and judge observational reports.

Reason Four - The narrator said he'd believe anything, maybe his imagination led him to think the stranger was a ghost.

Tina: *This author stated in the story that he'd believe anything at that moment. What with the storm going on and his imagination, he might have gotten carried away and thought he saw a ghost.*

Teacher: *Would you read that line to us?*

Tina: *(reads) "I could believe anything at that point."*

Tina used textual evidence to question the credibility of the narrator's observational report. Observational reports tend to be more believable when the observer is functioning at a moderate level of emotional arousal. Tina noted that the narrator admitted that his state of mind was susceptible to beliefs he might not otherwise entertain which led her to question his assertion that the stranger was the ghost of Amos. She used this as evidence to support the hypothesis that the stranger was Charlie Poole.

Reason Five - The stranger said he was the last surviving Poole. You'd have to be alive to be the last survivor.

Bart: *Well this guy says that he's the last Poole left. If he was the last Poole left, then he'd have to be alive.*

Teacher: *Hum, I see your logic. If you're a survivor, then you must be alive--the last surviving Poole.*

Bart offered a reason that he reached deductively. He demonstrated his ability to use if--then reasoning (conditional logic). Bart's deductive reasoning in the traditional argument form would look like this:

If the stranger was the last surviving Poole, then he must be alive.
Surviving entails being alive.
The stranger was the last surviving Poole.
Therefore, the stranger was alive.

Bart's argument rests on the unstated assumption that ghosts are representations of people who are dead, and if you are alive then you cannot be a ghost. This assumption was, I believe, accepted by everyone throughout the lesson because each student's reasoning depended on the acceptance of this unstated assumption. This sort of assumption functions as a premise in deductive or inductive reasoning. Acceptance of a deductive or inductive conclusion depends upon accepting the underlying assumptions that may or may not have been stated.

Reason Six - Ghosts are transparent and things float through them but nothing was floating through the stranger.

Sean: *Usually people have a theory about ghosts going through walls so anything can like pass through them, so if the guy's wet, he'd have to be human, or if he was a ghost, the water would just go through him. How would he ring the bell if everything goes through him?*

Teacher: *Okay - everything you know about ghosts or that you've read or seen, leads you to think that they're transparent and things go through them and that things weren't going through this stranger. Right?*

Sean: *Yeah.*

Teacher: *They didn't go through this guy cause he's actually holding the package and he had clothes on.*

Sean offered a definition of ghosts that makes it impossible for the stranger to be a ghost. Defining terms is one important way to achieve clarification. Sean reported a definition of ghosts that he believed was widely accepted by people in general. Sean exhibited critical thinking by offering a "reported" definition of ghosts and then showing how the stranger's characteristics did not fit the criteria usually associated with ghosts.

Evaluating the evidence given to support the hypothesis that the stranger was Charlie Poole

The evaluation of the evidence began with a challenge to Sean's definition of ghosts. Doug offered an alternative definition that ruled out the sixth reason as evidence that the stranger was not a ghost and therefore Charlie Poole.

Doug: *Well I disagree with reason 6 (Ghosts are transparent and things float through them but nothing was floating through the stranger). Take Caspar for example, sometimes Caspar's walking around and he goes through walls and sometimes people try to hit him and it goes through him. But, sometimes he picks stuff up and sometimes he leans against the wall and it doesn't go through him. Maybe, like, ghosts have a power or something that can make them transparent.*

Teacher: *Okay, so sometimes things go through them and sometimes they don't, so maybe they have the ability to hold things?*

Doug: *Yeah.*

Doug offered information that expanded Sean's definition of ghosts. Doug used his knowledge of the cartoon character "Caspar the Friendly Ghost" in order to show that things were not as simple as Sean suggested when it comes to what ghosts can and cannot do. Doug defined the term ghost by giving examples of what a well known ghost named Caspar does in different circumstances. Some of his examples indicated that objects do not always go through ghosts. Doug's contribution to defining ghosts was important because the definition he offered would not count as evidence that would be explained by the hypothesis that the stranger was not a ghost. According to Doug's definition, the stranger could have been a ghost.

Chris: *Well, I think the second reason (Charlie wanted to deliver the papers before he died so the storm didn't matter) is the best.*

Teacher: *Okay, why? Can you argue for it?*

Chris: *Well, for the first reason that Charlie looks like his father Amos now that he is older. Well, it could be but it's not really likely because I guess, I mean, I don't think he'd look exactly like him. I think there would have to be some kind of major differences because I don't think anyone really looks really a lot like their father and I think if he did look like his father, the narrator would have noticed some differences.*

On the third reason that bad lighting made it hard to see who was there--well even though that might be, usually you can make out the figure, their face or features so he could still tell who it was.

Then on the fourth reason, that the author says he'd believe anything, maybe his imagination led him to think it was a ghost. Well, that one could be it but it says that after they see um the ghost or, so like, it could be that after he sees the ghost he could believe anything rather than before.

Then on reason five the stranger says he was the last surviving Poole - you'd have to be alive. Well he could just be lying and still be a ghost.

And the sixth reason that ghosts are transparent--things go through them. Well, no one really knows that things can go through ghosts, because no one has ever really seen a ghost. Well, people have seen ghosts but they haven't seen them go through things and stuff like that.

Teacher: *Okay, what you just did is a good strategy. You told us you'd like the second reason and then you showed us the weaknesses of all the other reasons. This probably helped you be more convinced that the second reason is the strongest reason. This strategy of eliminating alternatives is one way we can weed through a whole bunch of reasons. We find weak spots in the other reasons and the one reason that doesn't have any weak spots is the best reason.*

In general the strategy that Chris employed does reflect and promote critical thinking but Chris neglected to give good reasons to support his contention that the best reason was that the stranger needed to deliver some papers before he died and therefore did not care about being out in a bad storm. I think Chris employed a good strategy but neglected to build a strong case for the reason he was promoting. Probably he put all his efforts into showing the weaknesses of the other reasons. Nevertheless, his use of the "process of elimination" strategy was instructive for the other students to see, and it gave me an opportunity to point out the benefits of that strategy when deciding what to believe or trying to convince others of something (Brophy, 1981).

Doug: *I think that the narrator says he'd believe anything and maybe it's his imagination that led him to think that it was a ghost is a good reason. Maybe like his kid was scared because the lights were out and everything and the kid said "Oh, no, there's a ghost in my closet." So he (the narrator) said there's no such thing as a ghost. But, in the back of his mind maybe he asked himself "Is there really ghosts?" When that guy (the stranger) came, and with the bad lighting his imagination ran wild and he thought the guy looked like Amos Poole.*

Teacher: *Oh, you're saying we don't know what happened before he answered the door. Maybe something happened that put ghosts in the back of his mind because it was such a creepy night to be at the seashore. It was like the power of suggestion.*

Doug offered a hypothesis that would explain why the narrator was in a state of mind that would make him susceptible to thinking that the stranger was a ghost. In critical thinking, one type of explanatory hypothesis is a claim about the beliefs and attitudes of people. Doug's hypothesis is based on an inference he made about the narrator's beliefs and attitudes on that day under the circumstances that prevailed.

Tina: *I say four is a good reason too. This guy (the narrator) he's really scared you know with the bad weather and there's fog out and maybe he doesn't like being alone with his family near the ocean. And the first reason goes with the third reason because with the bad lighting and, and Charlie resembling his father, you can see how the narrator might have thought it was Amos at the door.*

Teacher: *Yeah, that's a good point...*

Tina: *Because he couldn't see the man very well.*

Teacher: *Right - reasons one, three and four explain why the narrator thought he saw Amos when it was really Charlie Poole.*

Tina showed how the hypothesis that the stranger was Charlie Poole explains three of the reasons that were listed on the chalkboard. Tina considered the narrator's ability to make accurate observations and found that the conditions may have affected his ability to determine who the stranger at the door was. She recognized that the narrator may have been functioning at an emotional level that was unduly excited and that lack of proper lighting did not provide a satisfactory medium for making good observations. She pointed out that this could explain why the narrator mistook Charlie Poole for his father who was dead and buried 25 years before. Tina demonstrated critical thinking ability because she used appropriate criteria for judging the credibility of the narrator's statements about the stranger, and she offered an explanation based upon three reasons that would explain why the narrator thought the stranger was the ghost of Amos Poole.

Lisa: *I think reasons three and four go together. I like those because on four, the narrator says he'd believe anything which might have led him to think it was a ghost and three is that bad lighting made it hard to see who was there. The stranger could have been anybody but because of the weather and everything, the narrator could have let his imagination lead him to think it was Amos even though, he knew Amos was dead.*

Lisa's comments showed that she understood and agreed with Tina's view that the situation in the story is best explained by at least two and maybe three of the reasons that were listed as evidence for the hypothesis that the stranger was Charlie Poole. Both Tina and Lisa moved away from looking for the "best" reason to looking at which subset of reasons provides the best support for the hypothesis. This indicates that they were taking more evidence into account in order to understand the story.

Jake: *Well, I agree with reason 4, the narrator said he'd believe anything--maybe his imagination led him to think the stranger was a ghost because I found a weakness with the reason Chris gave.*

Teacher: *What's that?*

Jake: *Chris said the best reason was that the stranger wanted to deliver the papers before he died and the storm didn't matter. Well, if you're going to die the next day, you usually can't get up and walk around for miles on the beach.*

Chris: *How do you know he was walking a mile?*

Jake: *Well, how do you know he wasn't?*

Teacher: *Well, maybe he wasn't going to die exactly the next day, but he knew he was going to die sometime in the near future.*

Jake: *Yeah, but usually you'd be in the hospital unless you are stupid and they'd be trying to work on you, trying to cure you or something.*

Jake challenged the acceptability of a reason that Chris had offered and later defended as the "best" reason. Jake explained why he thought the reason did not support the hypothesis that the stranger was Charlie Poole. Neither Chris nor Jake attempted to bolster their arguments regarding this reason with textual evidence. As I pointed out earlier, I do see some textual evidence to support the possibility that Charlie Poole was nearing the end of his life and may have been more concerned with seeing the lighthouse and disposing of some family papers than he was afraid of endangering his health by being

out in a storm. The students' discussion would have been enhanced had they looked in the text to find support for their views.

Chris: *Well, there is a problem with reason 4 (The narrator said he'd believe anything, maybe his imagination led him to think the stranger was a ghost) because it says in the story that his imagination was running away with him after. So I think that would mean that if a stranger came to the door, then he would really jump to the conclusion that he was a ghost or something like that. But it doesn't say anything about his imagination running wild before he talked to the stranger. So I think he was still calm when the stranger came to the door.*

Teacher: *Oh, all right! What you're saying is that his imagination was more affected after the incident rather than before or during his encounter with the stranger.*

Chris: *That's what it says in the story.*

Chris made an important point which reflected his careful reading of the text. The fact that the line "I could believe anything at that point," comes after the narrator and the stranger at the door have talked suggests that the narrator was not necessarily in a vulnerable state before or during his interaction with the stranger. Chris' point is important because it discredits using the narrator's statement as a possible explanation for why he thought the stranger was a ghost. Rather the fact that the narrator thought the stranger was a ghost explains why the narrator ends up feeling he could believe anything. A careful reading of the text is essential for thinking critically. If the text is not interpreted carefully then the critical thinking will be based on misinformation. The fact that the author has the narrator say "I could believe anything at that point" after the stranger leaves is important because it implies that the incident with the stranger boggled the narrator's mind. The issue was what caused what? Chris tried to clarify this issue.

At the time of the lesson, I did not appreciate the significance of Chris' point. If I had realized the importance of what Chris was saying, I would have tried to explore it with the other students because they needed to see that the fourth reason on the list was probably not valid.

Making a decision about the identity of the stranger at the door

Teacher: *I would like to know who you think the stranger at the door was. How many of you think that the stranger at the door was the ghost of Admiral Amos Poole? How many of you think it was Charlie Poole?*

Six of the eight students thought the stranger at the door was Charlie Poole. Doug was the only student who thought the stranger was the ghost of Amos Poole and Lisa was the only student who said she did not know who the stranger was. In retrospect, I think it would have been interesting to ask them at the beginning of the lesson who they thought the stranger was to see if their thinking during the lesson changed previously held views. The explanations the students gave for who the stranger was were based on reasoning that had been explored in the lesson.

Discussion

A lot of territory has been covered in my efforts to analyze this critical-thinking-reading lesson. It is now time to step back from the specifics of the transcript and review what has been learned. The critical thinking abilities and dispositions the lesson was intended to elicit have been identified and the transcript has provided evidence that the students had the ability to engage in many aspects of critical thinking, some of which went beyond the lesson objectives. The transcript also revealed instances where critical thinking went awry and/or was not fully realized. Pedagogical strategies have been mentioned that should help to foster critical thinking.

The lesson began with a question about whether or not the students believed in ghosts. This was an important issue to begin with because they needed to be reminded that their beliefs could alter their thinking about the stranger's identity. Temporarily setting aside their own beliefs was appropriate because what mattered was whether or not the narrator had sufficient evidence to conclude that the stranger was a ghost. I wanted the students to try to be open-minded so they would seriously consider points of view that differed from those they expressed at the beginning of the lesson, and reason from premises that they might normally reject.

The ability to give reasons played a central role in this lesson. The students were expected to give reasons that could serve as evidence for two explanatory hypotheses. Also, they were expected to give reasons to support their judgments when they evaluated the strength of those reasons. The transcript shows that the students were able to offer many reasons to support their views. In formulating their reasons, they made inferences that integrated their background knowledge with textual information, they reasoned inductively and deductively, and they used established criteria to make judgments about the credibility of statements and the reliability of observational reports.

Students were asked to clarify statements when there was some doubt about the pertinence of what they were saying. They were asked for textual evidence to support their statements and they were asked to elaborate further when something was not clear. The students clarified their ideas both when asked to do so and of their own accord.

The analysis of this transcript has provided evidence that these students did use critical thinking when given the opportunity. This does not necessarily mean that they arrived at the "truth" or constructed the best understanding of the text, but it does show that they tried to engage in "reasonable, reflective thinking in order to decide what to believe" regarding the stranger's identity. It also does not mean that their critical thinking was flawless.

The problems which interfered with critical thinking are very important to note because they inform us as educators about what we need to attend to in order to help students improve their critical thinking. Sometimes critical thinking went awry because they misread the text and this led to reasoning that could not be supported with textual evidence. Also, they made assumptions that were unfounded and sometimes it appeared that their background knowledge interfered with getting the author's intended meaning.

At other times, their critical thinking did not go far enough. For example, the students neglected to question the premises of arguments that their classmates presented. It is possible that they did not know or consider that an argument is only sound to the extent to which it is based upon acceptable premises. Critical thinking instruction should lead students to question and evaluate the premise(s) of arguments.

Sometimes the students neglected to consider new information. One student pointed out that it was not until the end of the story that the narrator said he "could believe anything." The other students should have realized that this raised a question regarding whether this disclosure should have been used as evidence that the narrator's judgment about the stranger was unreliable. In critical thinking, it is important to reconsider positions on an issue when new evidence is introduced that supports another view.

Critical thinking is a complex process and it gets even more complicated when factors impede or interfere with it. This is why it is important for the teacher to try and be alert to the types of problems that might arise so that she can help students learn how to improve their critical thinking. The fact that students exhibit critical thinking abilities and dispositions does not mean that there is not room for improvement. The ability to think critically improves when students are encouraged to think about the quality of their thinking.

There are other pedagogical considerations that can help facilitate teaching a critical-thinking reading lesson. One recommendation is that the teacher establish a way of proceeding through the material that is orderly. A lesson that follows an orderly procedure can help to provide everyone with some time to think, which is necessary if careful consideration is going to be given to each issue that is raised. The teacher should discourage discussions that jump helter skelter from one issue to another because each issue deserves a chance for close examination before another issue is introduced.

One way the teacher can buy time for thinking and discourage flitting from issue to issue is to restate, rephrase, summarize, seek clarification, or apply what a student has said. This is helpful because it provides an opportunity for the teacher to validate and verify each student's thinking and it gives the other students time for reflection. Also, writing the students' reasons on the chalkboard helps the discussion proceed in an orderly fashion because the students can refer to each other's reasons and do not have to rely on their ability to remember all the points that have been made. The students in this lesson did refer back to reasons that were given earlier in order to offer alternative explanations. It is possible that this was easier to do because they could view the ground that had been covered and this stimulated their thinking.

In teaching a critical-thinking reading lesson it is often better to elicit information from the students than it is to give them information. When a student appears to be mistaken about something in the text, it is better to ask questions that probe their thinking rather than try to "correct" their thinking. This approach helps to foster an atmosphere of cooperative thinking and learning and breaks down the traditional dynamics of the teacher as expert who has all the "right" answers.

Another pedagogical strategy that was tried in this lesson in order to get students to think evaluatively was directing them to look for the "best" reason. This is not the only way to get students to evaluate but it seems to have been effective in this lesson. This strategy is potentially problematic because students might fail to recognize that there are often a number of reasons that provide the best explanation. The degree to which this strategy may be problematic can only be determined through additional research that studies the effectiveness of particular pedagogical strategies for teaching critical-thinking reading lessons.

This analysis of a critical-thinking reading lesson has tried to provide substantive evidence that there does exist an interdependent relationship between critical thinking and reading comprehension. For these students, comprehending text required critical thinking, and thinking critically about the text relied upon a certain level of reading comprehension. The literature on critical thinking and reading will benefit from additional detailed examples that illustrate the relationship between critical thinking and reading comprehension because teachers need information that will help them design and teach lessons that will improve students' reading ability.

References

Anderson, R. C., Reynolds, R. E., Schallert, D. L., & Goetz, E. T. (1977). Frameworks for comprehending discourse. *American Educational Research Journal, 14,* (4), 367-381.

Brophy, J. (1981). Teacher praise: A functional analysis. Review of Educational Research, 51, 5-32.

Brophy, J. & Good, T. L. (1986). Review of literature on teacher behavior and student achievement. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (pp. 328-375). New York: Macmillan Publishing Company.

Betts, E. A. (1950). Guidance in the critical interpretation of language. *Elementary English, 27,* 9-18.

Carey, R. F., Harste, J. C., & Smith, S. L. (1981). Contextual constraints of discourse processes: A replication study. *Reading Research Quarterly, 16*(4), 201-212.

Clymer, T., Peterson, S. W., Gates, D., L'Amoreaux, M., & Wardeberg, H. (1976). *Mountains are for climbing.* Lexington, MA: Ginn and Company.

Ennis, R. H. (1962). A concept of critical thinking. *Harvard Educational Review, 32*(1), 81-111.

Ennis, R. H. (1964). A definition of critical thinking. *The Reading Teacher, 17*(8), 599-612

Ennis, R. H. (1987). A taxonomy of critical thinking dispositions and abilities. In R. J. Sternberg & J. B. Baron (Eds.), *Teaching for thinking: Theory and practice* (pp. 9-26). New York: W. H. Freeman and Company.

Fisher, L. E. (1972). *The Death of Evening Star.* New York: Doubleday.

Flanders, N. A. (1965). *Teacher influence, pupil attitudes, and achievement.* (Cooperative Research Monograph No. 12, OE-25040). Washington, DC: Office of Education.

Hildyard, A. & Olson, D. R. (1982). *Reading expository material.* New York: Academic Press.

Gray, W. S. (1949). Basic competencies in efficient reading. In W. S. Gray (Ed.), *Reading in an age of mass communication* (pp. 58-74). New York: Appleton-Century-Crofts.

Markham, E. M. (1985). Comprehension monitoring: Developmental educational issues. In S. F. Chipman, J. W. Segal, & R. Glaser (Eds.), *Research and open questions: Vol. II. Thinking and learning skills.* (pp. 275-291). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Meichenbaum, D. (1985). Teaching thinking: A cognitive-behavioral perspective. In S. F. Chipman, J. W. Segal, & R. Glaser (Eds.), *Research and open questions: Vol. II. Thinking and learning skills.* (pp. 407-426). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Norris, S. P., & Phillips, L. M. (1987). Explanations of reading comprehension: schema theory and critical thinking theory. *Teachers College Record, 89*(2), 281-306.

Pearson, P. D., & Tierney, R. J. (1984). On becoming a thoughtful reader: Learning to read like a writer. In A. C. Purves & O. Niles (Eds.), *Becoming readers in a complex society* (Part I. Eighty-third yearbook of the National Society for the Study of Education). Chicago: University of Chicago.

Russell, D. (1961). *Children learn to read.* Boston: Ginn.

Scheffler, I. (1965). *Conditions of knowledge*. Chicago: Scott Foresman and Co.

Spiro, R. J., Bruce, B. C., & Brewer, W. F. (Eds.). (1980). *Theoretical issues in reading comprehension*. Hillsdale, NJ: Erlbaum.

Swartz, R. J. (1987). Teaching for thinking: A developmental model for the infusion of thinking skills into mainstream instruction. In J. B. Baron & R. J. Sternberg (Eds.), *Teaching thinking skills: Theory and practice* (pp. 106-126). New York: Freeman.

Thorndike, E. L. (1917). Reading as reasoning: A study of mistakes in paragraph reading. *The Journal of Educational Psychology, 8*(6), 323-332

Wolf, W., King, M. L., & Huck, C. S. (1968). Teaching critical reading to elementary school children. *Reading Research Quarterly, 3*(4), 435-498.

Authors Note

I am grateful to the following individuals who contributed helpful comments on previous drafts of this paper: Richard Anderson, Robert Ennis, Mary Foertsch, Georgia Garcia, Douglas Hartman, David Pearson, and Marlene Schommer.